D.T.E. 03-6 June 30, 2005

Review by the Department of Telecommunications and Energy, pursuant to G.L. c. 25, § 19 and G.L. c. 25A, § 11G, of Boston Edison Company, Cambridge Electric Light Company, and Commonwealth Electric Company's 1998, 1999, and 2000 Demand-Side Management Evaluation Reports.

APPEARANCES: David S. Rosenzweig, Esq.
Keegan Werlin LLP
265 Franklin Street
Boston, MA 02110
FOR: COMMONWEALTH ELECTRIC COMPANY,
CAMBRIDGE ELECTRIC LIGHT COMPANY,
and BOSTON EDISON COMPANY
Petitioners

Steven I. Venezia, Esq.
Commonwealth of Massachusetts
Division of Energy Resources
100 Cambridge Street, Suite 1020
Boston, MA 02114
FOR: DIVISION OF ENERGY RESOURCES
Intervenor

William August, Esq.
Epstein & August, LLP
101 Arch Street
Boston, MA 02110
FOR: TOWN OF WINCHESTER
Limited Participant

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I. INTRODUCTION

Boston Edison Company ("BECo"), Cambridge Electric Light Company ("Cambridge"), and Commonwealth Electric Company ("Commonwealth") d/b/a NSTAR Electric (together "Companies" or "NSTAR"), pursuant to G.L. c. 25, § 19 and c. 25A, § 11G, have filed with the Department of Telecommunications and Energy ("Department") demand-side management performance incentive reconciliation reports for the years 1998,[1] 1999, and 2000 ("Reports"). The Reports use quantitative analyses to assess energy and capacity savings resulting from the implementation of NSTAR's energy efficiency plans, approved by the Department in Cambridge Electric Light Company/Commonwealth Electric Company, D.T.E. 98-16 (1998); Boston Edison Company, D.P.U./D.T.E. 97-86 (1998); Boston Edison Company, D.P.U./D.T.E. 97-86-A (1999); Boston Edison Company, Cambridge Electric Light Company, and Commonwealth Electric Company, D.T.E. 00-63 (2001). The Reports also include calculations of shareholder incentives based upon each year's savings. The Companies' petition was docketed as D.T.E. 03-6.

On February 10, 2003, the Department issued a notice requesting public comments and participation in NSTAR's filing. The Commonwealth of Massachusetts Division of Energy

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1 The 1998 evaluation reports affect only BECo. The Department approved the savings estimates and shareholder incentives for Cambridge and Commonwealth in a letter order. Cambridge Electric Light Company/Commonwealth Electric Company, D.T.E. 98-16-A (September 18, 2001).

Resources ("DOER") was granted intervenor status. The Town of Winchester filed comments and was granted limited participant status. The evidentiary record consists of 75 exhibits.[2]

II. STANDARD OF REVIEW

The Department is required by statute to review and approve energy efficiency programs in order to determine whether they were delivered in a cost-effective manner, utilizing competitive procurement process to the fullest extent practicable.[3] G.L. c. 25, § 19, G.L. c. 25A, § 11G. The Department has established guidelines that set forth (1) the method by which the cost-effectiveness of Energy Efficiency Programs shall be determined and (2) the method by which Distribution Companies and Municipal Aggregators shall evaluate the performance of their Energy Efficiency Programs and the method by which the Department will review those evaluations. Order Promulgating Final Guidelines to Evaluate and Approve Energy Efficiency Programs, D.T.E. 98-100, at 1, Att. 1 ("Guidelines for the Methods and Procedures for the Evaluation and Approval of Energy Efficiency Programs"), § 3, § 4.2.2 (2000) ("Guidelines"). Energy Efficiency programs are deemed cost-effective if their benefits

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2 On its own motion, the Department moves the responses into the record of this proceeding. The information responses are marked as Exhs. DTE-1-1 through 1-22; DTE-2-1 through 2-29 except DTE-2-27; DTE-3-1 through DTE-3-9; DTE-4-1 through DTE-4-6; and DTE-5-1. NSTAR's 2001 and 2000 Annual Reports are marked as Exhs. NSTAR-1 and NSTAR-2, respectively. NSTAR's program evaluations are marked as follows: 1998 IRM as Exh. NSTAR-3; Residential High Use as Exh. NSTAR-4; Torchieres as Exh. NSTAR-5; C&I New Construction and Large C&I Retrofit as Exh. NSTAR-6; Small C&I Retrofit as Exh. NSTAR-7; Low-Income Process Evaluation as Exh. NSTAR-8; and Low-Income Single Family 2000 Implementation Analysis as Exh. NSTAR-9.

3 The Department notes that NSTAR's level of competitive procurement has been previously reviewed. D.T.E. 00-63, at 6-7.

are equal to or greater than their costs. Id., § 3.5.[4] In addition, the Guidelines specify the method for the calculation of shareholder incentives that may result from the implementation of Energy Efficiency programs. Id., § 5.

With respect to evaluations of the savings achieved by energy efficiency programs, the Guidelines provide that

> All such evaluations shall be reviewable, appropriate, and reliable, consistent with Department precedent concerning these terms. A variety of evaluation and assessment methods are appropriate, depending on the nature of the programs and markets being addressed. Reliable evaluations are sufficiently unbiased and sufficiently precise.

Id. at § 4.2.2(a); see Massachusetts Electric Company, D.P.U. 92-217-B, at 4-6 (1994) ("D.P.U. 92-217-B"); Boston Edison Company, D.P.U. 96-1-CC (1996) ("D.P.U. 96-1-CC"); Boston Gas Company, D.P.U. 94-15 (1995).

III. PREVIOUS NSTAR ENERGY EFFICIENCY RULINGS

A. BECo's Programs

1. 1998

In D.T.E. 97-86, the Department approved BECo's 1998 Energy Efficiency Plan as part of a settlement that resolved all issues associated with BECo's Five-Year Energy Efficiency Plan 1998-2002 ("BECo Five-Year Plan"). BECo's 1998 incentive method was also approved in D.T.E. 97-86. D.T.E. 97-86; BECo Five-Year Plan at 3. In approving

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[4] The Guidelines also specify the criteria that the Department employs to determine whether a proposed energy efficiency program will be cost-effective. Id., § 3, § 4.2.1. The Department notes that the Guidelines apply to NSTAR's year 2000 programs. For NSTAR's 1998 and 1999 programs, cost-effectiveness is based on the costs and benefits for an electric utility. See e.g., D.T.E. 00-63, at 8.

BECo's Five-Year Plan the Department approved a pre-tax incentive for BECo of up to 11.5 percent of eligible program budgets in 1998 subject to achievement of the performance metrics agreed upon in the settlement (D.T.E. 97-86, at 3; BECo Five-Year Plan at 3).[5] Performance metrics for 1998 were specified BECo's Five-Year Plan approved by the Department in D.T.E. 97-86 (BECo Five-Year Plan, at 5; Chapter 4, at Table EC-2).

For 1998, BECo calculated that it earned shareholder incentive payments of $1,903,696 (Boston Edison Motion dated October 18, 1999, Attachment D). The Department accepted the Company's shareholder incentive calculation on a preliminary basis subject to reconciliation based on measured energy savings and capacity savings for the affected programs. D.T.E 97-86-A, at 2-3. The Department notes that BECo has submitted 1998 energy and capacity savings data and supporting analyses (Exh. DTE 5-1, Attachment DTE 5-1(A)). In particular, BECo submitted an "Impact, Persistence and Process Assessment of Boston Edison Company's 1998 Integrated Resource Management Programs" dated July 28, 2000 ("1998 Assessment") (NSTAR Energy Efficiency Evaluation Report 2000 dated August 7, 2000, Executive Summary at 2,8; Tab VI, at 1). The 1998 Assessment analyzed the savings and persistence levels of BECo's (1) Large Commercial and Industrial Retrofit Program, (2) Small Commercial and Industrial Retrofit Program, (3) Commercial and Industrial Lost Opportunity Program, (4) Residential Retrofit Program, and (5) Residential Lost Opportunity Program (id.

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5 Eligible program budgets for 1998 were defined as the Integrated Resource Management programs, the Energy Conservation Service program, and the New Demand-Side Management programs (BECo Five-Year Plan Executive Summary at Table EX-1).

at Tab VI). The 1998 Assessment relied on techniques including statistical sampling, on-site inspections, and telephone surveys (id. at Executive Summary at 2,8; Tab VI, at 2). Accordingly, based on the foregoing, the Department finds that no further reconciliation of BECo's 1998 energy and capacity savings is necessary.

2. 1999

The 1999 BECo Plan was submitted as part of a Motion for Approval of Updated 1999 Energy Efficiency Program Budget and 1999 Performance Metrics filed by Boston Edison on October 18, 1999. The 1999 BECo Plan was approved in D.T.E 97-86-A. The 1999 BECo incentive method was approved in D.T.E. 97-86 (BECo Five-Year Plan at 3). The Department approved a pre-tax incentive for BECo of up to 12.8 percent in 1999 of eligible program budgets subject to achievement of the performance metrics listed in the BECo Five-Year Plan. D.T.E. 97-86, at 3; BECo Five-Year Plan at 3.[6] Performance metrics for 1999 were submitted as part of a Motion for Approval of Updated 1999 Energy Efficiency Program Budget and 1999 Performance Metrics filed by Boston Edison on October 18, 1999. The 1999 BECo performance metrics were approved in D.T.E 97-86-A. That approval was made with the understanding that the energy savings targets for the 1999 C&I New Construction and C&I Retrofit programs be based ultimately on energy savings achieved. D.T.E 97-86-A at 2.

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6 Eligible program budgets for 1999 were defined as the Integrated Resource Management programs, the Energy Conservation Service program, and the New Demand-Side management programs (BECo Five-Year Plan Executive Summary at Table EX-1).

The Department notes that BECo has submitted energy savings data for its 1999 C&I New Construction and 1999 C&I Retrofit programs (Exh. DTE 5-1, Attachment DTE 5-1(B); NSTAR Energy Efficiency Annual Report 2001, Table S). Further, BECo submitted impact evaluations addressing (1) its 1999 Large C&I Retrofit and C&I New Construction programs, and (2) its 1999 Small C&I Retrofit Programs (Large C&I Retrofit and C&I New Construction Programs Impact Evaluation, October, 2001; Impact Evaluation of NSTAR's Small C&I Retrofit Programs, October 26, 2001). These evaluations used statistical sampling, billing analysis, and on-site tests to validate savings estimates (Large C&I Retrofit and C&I New Construction Programs Impact Evaluation, October, 2001; Impact Evaluation of NSTAR's Small C&I Retrofit Programs, October 26, 2001). Accordingly, the Department finds that no further reconciliation of BECo's 1999 C/I New Construction and C/I Retrofit program energy savings is necessary. NSTAR stated that based on program performance BECo's 1999 shareholder incentive payments amount to $3,494,928 (Exh. DTE 5-1, Attachment DTE 5-1(B)).

B. Cambridge and Commonwealth

1. 1998

On June 18, 1998 Cambridge and Commonwealth filed with the Department their Five-Year Energy Efficiency Plan covering the period 1998-2002 ("Cambridge/Commonwealth Five-Year Plan"). On July 31, 1998, the Department approved Cambridge/Commonwealth's Five-Year Plan as part of a settlement that resolved all issues associated with Cambridge/Commonwealth's Five-Year Energy Efficiency Plan.

D.T.E.98-16, at 2. On September 24, 1999, Cambridge and Commonwealth filed with the Department a letter requesting that the Department approve: (1) 1998 performance incentives for Cambridge in the amount of $314,855 and (2) 1998 performance incentives for Commonwealth in the amount of $942,049. Cambridge and Commonwealth Letter, September 24, 1999, at 1. In making this request Cambridge and Commonwealth noted that the performance metrics and incentive calculation for 1998 had already been approved by the Department in D.T.E. 98-16.

On December 29, 1999, the Department approved the 1998 incentives claimed by Commonwealth and Cambridge subject to an adjustment for the portion related to measured energy savings. Cambridge Electric Light Company/Commonwealth Electric Company, D.T.E. 98-16, at 2 (Letter Order) (1999). In Cambridge Electric Light Company/Commonwealth Electric Company, D.T.E. 98-16-A (Letter Order)(2001), the Department reviewed measured energy savings data and found that no further reconciliation of incentives was necessary.

2. 1999

On April 7, 1999, Cambridge and Commonwealth filed a Joint Motion for Approval of Updated 1999 Demand-Side Management Budget and 1999 Performance Metrics, pursuant to a settlement agreement filed on June 18, 1998 and approved by the Department on in D.T.E. 98-16 (Cambridge and Commonwealth Letter to the Department dated April 7, 1999, D.T.E. 98-16). Cambridge and Commonwealth stated that the Joint Motion would be deemed approved unless the Department notified Cambridge and Commonwealth of the need for more in-depth review within thirty days (Cambridge and Commonwealth Letter to the Department dated April 7, 1999, D.T.E. 98-16). There is no record of such Department action within the thirty day period.

In the Department-approved settlement agreement, D.T.E. 98-16, the incentive mechanism for Cambridge and Commonwealth was described as follows "if less than 50 percent of the applicable target is achieved, then the [Companies] shall earn no incentive for that metric; if between 50 percent through 85 percent of the applicable target is achieved, the [Companies] shall earn a linear incremental incentive for every additional percentage of the target that is achieved. If over 85 percent of the applicable target is achieved, the [Companies] shall earn 100 percent of the incentive for that metric" (Exh. DTE 5-1, at 2, citing Cambridge/Commonwealth Five-Year Plan at 5).

NSTAR stated that based on program performance Cambridge's 1999 shareholder incentive payments amount to $389,924 (Exh. DTE 5-1, Attachment DTE 5-1(B)). NSTAR stated that based on program performance Commonwealth's 1999 shareholder incentive payments amount to $1,101,577 (id.).

C. Year 2000

On July 27, 2000, BECo, Cambridge, and Commonwealth filed with the Department their three-year Energy Efficiency Plan covering the period 2000-2002, including performance metrics for the year 2000. D.T.E. 00-63; NSTAR Energy Efficiency Plan 2000-2002, Tables 5a, 5b, 5c. On June 13, 2001, the Department approved the year 2000 energy efficiency plans and performance metrics for BECo, Cambridge, and Commonwealth. D.T.E. 00-63, at 3, 8.

The Settlement approved by the Department in D.T.E. 97-86 provided that the Company be allowed to earn an incentive for performance in years 2000 through 2002 at a 12.8 percent level, subject to performance and revisions if such incentive level is inconsistent with any regulatory decisions, statutes, or similar government mandates in effect for 2000 through 2002 that are generally applicable to Massachusetts electric distribution companies. Settlement at 3. On February 7, 2000 the Department issued Guidelines applicable to electric companies and municipal aggregators addressing, among other things, shareholder incentive calculation procedures. D.T.E. 98-100, Att. 1, Section 5. The Guidelines state that an electric company's shareholder incentive calculation consist of (1) the average yields of the three-month United States Treasury Bills issued during the most recent twelve-month period, (2) total program implementation costs as defined in the Guidelines, and (3) the percentage of performance level achieved. D.T.E. 98-100, Att. 1, Section 5.3.

NSTAR stated that shareholder incentive payments for the year 2000 were calculated in accordance with Section 5 of the Guidelines (Exh. DTE 5-1, Attachment DTE 5-1(C)). According to NSTAR's calculations, BECo earned a shareholder incentive of $4,167,446 for the year 2000; Commonwealth earned a shareholder incentive of $1,055,310 for the year 2000; and Cambridge earned a shareholder incentive of $579,283 for the year 2000 (id.).

III. NSTAR'S PROGRAMS AND SAVINGS

A. Residential Programs

1. Description

NSTAR offered twelve residential programs: Energy Star Lighting; Energy Star Products; Energy Star Homes; High Use; Single-Family Low Income; Multi-Family Low Income; Integrated Resource Management ("IRM") Retrofit; IRM New Construction; IRM Non-Heating; IRM Heating; Heat Pump; and Education (Exh. NSTAR-1, Table S).[7]

NSTAR stated that the High Use; Single-Family Low Income; Multi-Family Low Income; and all four IRM programs provided participants with products and services such as compact fluorescent light bulbs ("CFLs"); hot water measures (tank wraps, low-flow showerheads, faucet aerators); insulation and air sealing; maintenance and repair for heating, ventilation and air conditioning ("HVAC") systems; programmable thermostats; replacement of inefficient refrigerators and other appliances; and consumer education (id. at 1-16; Exh. NSTAR-2, at 9). Depending on the program, participants paid from zero to 25 percent of the cost of the measures installed (Exh. NSTAR-1, at 7-16). The Energy Star Lighting program offered rebates and marketing for CFLs, torchieres, other lighting fixtures, and ceiling fans incorporating CFLs, via a catalog and in-store purchases (id. at 1-2). The Energy Star Appliances program offered rebates and marketing initially for horizontal-axis, front-

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[7] NSTAR identified the three Energy Star programs as market transformation programs that are jointly implemented with other utilities (Exh. NSTAR-1, at 1-6). Market transformation programs are strategic efforts to offset market failures and to induce lasting changes that result in the adoption or penetration of energy efficient technologies and practices. D.T.E. 98-100, at 28 n. 22; Guidelines §4.2.1(b).

loading clothes washers, and expanded in 2000 to include marketing for efficient refrigerators, dishwashers, and air conditioners (id. at 3-4). The Energy Star Homes program, which targets builders and markets to several other audiences, focuses on all end-uses, including insulation, HVAC and hot water equipment, appliances, and light fixtures, and offers rebates up to $1,000 per home based on post-construction inspection and testing (id. at 5).

2. Methods for Evaluating Residential Savings

NSTAR evaluated the savings from its residential programs using a variety of methods: (1) billing analyses of participants; (2) end use metered data; (3) engineering equations; (4) rebate and sales information; (5) market surveys; (6) counts of equipment installed in new homes and low-income homes; (7) baseline practice or market share surveys and estimates; (8) surveys of participants to estimate what they would have done absent the program; (9) field inspections and phone surveys for equipment to determine if it was still installed and operating; and (10) comparisons of savings per piece of equipment to savings measured in other studies (Exhs. NSTAR-3 at 26-27, 32-35; NSTAR-4 at 11-80; NSTAR-5; Exhs. DTE-1-4, 1-15, 1-22, 2-1, 2-3, 2-5, 2-6, 3-10).

3. Results of Evaluation Methods

Summed across the three program years and based on the results of evaluations and other studies NSTAR reported that its residential programs saved 77,071 megawatthours ("MWH") per year, or 860,778 MWH over the lifetimes of the measures installed (Exhs. NSTAR-1, Table S). NSTAR also reported 11,529 kilowatts ("KW") in capacity savings (id.).

For both its 1998 residential IRM programs, NSTAR reported gross energy realization rates of 84 percent (Exh. NSTAR-3, at 27-28).[8] To determine net savings, that is, to net out from gross savings what would have happened absent the program, NSTAR adjusted these estimates downward by five percent to account for free riders[9] and another two or four percent to account for limited persistence in the Retrofit and Lost Opportunity programs, respectively (id. at 33, 35).

NSTAR reported sampling precision levels[10] of eleven percent for its IRM Retrofit program, of ten and thirteen percent for its IRM Lost Opportunity program, and precision levels of 23 percent and eleven percent for gross savings in its Lighting Torchieres program, supplemented by ten precision levels of one to four percent for adjustments used to obtain net savings (Exhs. NSTAR-3, at 17, 20, 21; NSTAR-5, at E-5, E-11). NSTAR did not report precision levels for its Energy Star, Low Income, or High Use programs, for which it estimated savings according to various engineering algorithms and multiplied by the number of

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8 NSTAR provided realization rates for certain aspects of its residential programs. A realization rate is the ratio of savings estimated from a sample of participants to the engineering estimate of savings for that same sample; this ratio can be used to extrapolate savings to an entire population of participants. See D.P.U. 95-6-CC at 8.

9 A free rider is a customer who would have installed a measure in the absence of the Companies' programs.

10 The precision of a savings estimate is determined statistically as a function of the number of customers included in the analysis, i.e., the sample size and the variation in energy consumption among the sampled customers. For example, if the precision of a savings estimate was $\pm$ ten percent at the 90 percent confidence level, then there would be a 90 percent probability that actual savings were within ten percent of the estimated savings level. D.P.U. 92-217-B at 20 n. 30.

pieces of equipment affected (Exhs. NSTAR-4; DTE-3-10; DTE-4-3; DTE-4-4; DTE-4-5). However, NSTAR reported that it sampled 17 High Use homes to evaluate many measures and conducted 301 telephone interviews with Low-Income program participants to assess measure retention (Exhs. DTE-4-4; DTE-4-5).

4. Analysis and Findings

a. Overview

The Department reviews an electric company's evaluations to determine whether the evaluations are reviewable, appropriate, and reliable. See Section II, above.

With respect to the reviewability of NSTAR's residential evaluations, the Department notes that, with sufficient responses to several sets of information requests, these were clearly presented and sufficiently explained. Therefore, the Department finds NSTAR's residential evaluations to be reviewable.

With respect to the appropriateness of NSTAR's residential evaluations, the Department notes that NSTAR used methods such as billing analyses, end-use metering, engineering equations, and market and persistence surveys. In the past, the Department has approved such methods. D.P.U. 92-217-B at 9-16. Therefore, the Department finds NSTAR's residential evaluations to be appropriate.

With respect to the reliability of NSTAR's residential evaluations, the Department notes that reliability focuses on the lack of bias and the level of precision. See Guidelines § 4.2.2.

In this proceeding, the Department has reviewed the Company's filing and has found the precision and savings estimated for residential programs reported for the IRM programs and the lighting Torchieres program to be sufficient.

Because NSTAR's residential savings estimates are sufficiently unbiased and sufficiently precise, the Department finds them to be reliable. Accordingly, because they are reviewable, appropriate, and reliable, the Department accepts NSTAR's residential savings estimates.

B. Commercial and Industrial Programs

1. Description

NSTAR offered the following commercial and industrial ("C&I") programs: C&I New Construction, Large C&I Retrofit, Small C&I Retrofit, several market transformation initiatives, Boston Edison Energy Cooperative ("BEEC"), and the Generator Assistance Program ("GAP") (Exh. NSTAR-1, Table S).

The C&I New Construction program is open to any business for constructing a new building, for expansion, renovation, or remodeling of a current building, and to buy new, or replace failed, equipment (id. at 17). Eligible equipment including lighting, controls, HVAC equipment, compressed air systems, variable speed drives, insulation, and site-specific custom measures (id.). The program provides technical assistance and pays up to 75 percent of the incremental cost above standard equipment for most participants (id. at 18). The Large C&I Retrofit program also provides technical assistance and pays medium and large C&I customers up to 50 percent of the cost for the same types of equipment, but for replacement of functional yet inefficient equipment (id. at 19). The Small C&I Retrofit program provides technical assistance and pays small businesses (those that use less than 100 KW) up to 80 percent of the installed cost for lighting, refrigeration controls, and HVAC tune-ups (id. at 21). BEEC and GAP were demand response programs. Boston Edison Company, D.P.U./D.T.E. 97-1-CC, at 15 (1998). BECo paid a certain amount per KW per activation for BEEC participants to reduce peak demand when called and for GAP participants to run stand-by generators when called. Id.

2. Methods for Evaluating C&I Savings

a. Site-Specific Engineering Re-Analyses

For the Large C/I Retrofit and C/I Lost Opportunity programs, NSTAR relied primarily on site-specific engineering re-analyses for stratified samples of participating facilities (Exhs. NSTAR-3, at 16, 19; NSTAR-6, at i-ii). NSTAR stated that this method, involved numerous measurements in some of the programs, including (1) spot-Watt metering of installed equipment; (2) multi-week metering of lighting, HVAC, and variable speed motors; (3) recorded quantities of industrial inputs and outputs; and (4) records of ambient air temperature and humidity upon which savings from HVAC and refrigeration systems depend (Exh. NSTAR-6, at 1, 28-30). Some site-specific engineering re-analyses also involved building simulations calibrated to actual bills showing hourly demand over longer periods (id. at 30).

b. Small C/I Programs

For its 1999-2000 Small C/I program, NSTAR first performed a billing analysis for lighting measures, while for refrigeration and HVAC measures NSTAR performed site visits on a sample representing all the technologies, using manufacturer data to check savings based on the equipment as it was actually hooked up and used on site (Exh. NSTAR-7, at 2-3 through 2-9, 4-3 through 4-7).[11] After checking initial model specifications that showed realization rates of roughly zero for lighting, NSTAR checked for two major problems: (1) changes in energy use unrelated to the program and (2) failure to find and use all the meters from businesses with multiple meters (id. at 2-2, 3-2). NSTAR addressed the first problem by eliminating participants who reported any change in their business (such as increased operating hours), thereby increasing the realization rate from zero to 39 percent (id. at 2-5 through 2-9). However, NSTAR stated that it was not able to address the second problem effectively (id. at 3-2). Therefore, NSTAR considered several alternatives and chose for lighting only, to rely on the 71 percent realization rate from Massachusetts Electric Company's Small C/I program billing analysis (id. at 3-7; Exh. DTE-2-28).

3. Results of Evaluation Methods

Summed across the three program years and based on the results of evaluations and other studies, NSTAR reported that its C/I programs saved 170,464 MWH per year, or

[11] NSTAR applied the results from samples of 1999 participants to its 2000 participants (Exh. NSTAR-7, at 1-3, 2-1, 4-1, 5-5).

2,614,618 MWH over the lifetimes of the measures installed (Exhs. NSTAR-1, Table S). NSTAR also reported 107,321 KW in capacity savings (id.).

To develop realization rates, NSTAR compared the savings of its C&I programs as determined by evaluations with the savings amounts estimated immediately following actual installation. NSTAR reported gross realization rates 107 percent for the 1999-2000 Large C/I Retrofit program, 126 percent for the 1999-2000 C/I Lost Opportunity program, and 72 percent for the 1999-2000 Small C/I program (Exhs. NSTAR-3, at 23-25; NSTAR-6, at 43; NSTAR-7, at 5-5). After adjustment for estimates of what would have happened absent the programs,[12] NSTAR reported net realization rates 71 percent for the 1999-2000 Large C/I Retrofit program, 62 percent for the 1999-2000 C/I Lost Opportunity program, and 68 percent for the 1999-2000 Small C/I program (Exhs. NSTAR-3, at 4, 23-25; NSTAR-6, at 66; NSTAR-7, at 5-5).

NSTAR reported overall precision of 9.5 percent for gross savings in its 1999-2000 Large C/I Retrofit and C/I Lost Opportunities programs (Exh. NSTAR-6, at 39). NSTAR report precision levels of ten percent for the lighting portion of its 1999-2000 Small C/I program and 18 percent for the non-lighting portion (Exh. NSTAR-7, at 5-4).

12 The adjustments were primarily free riders, offset for the 1999-2000 programs to a small extent by spillover (Exhs. NSTAR-3, at 31-35; NSTAR-6, at 58-62; NSTAR-7, at 5-4). Spillover refers to additional conservation actions taken by a customer as a result of participation in a program.

4. Analysis and Findings

a. Overview

The Department reviews an electric company's evaluations to determine whether its evaluations are reviewable, appropriate, and reliable. See Section II, above. With respect to the reliability of NSTAR's C&I evaluations, the Department focuses on the lack of bias and the level of precision. See Guidelines § 4.2.2.

With respect to the reviewability of NSTAR's C&I evaluations, the Department notes that NSTAR's C&I evaluations were clearly presented and sufficiently explained. Therefore, the Department finds NSTAR's C&I evaluations to be reviewable.

With respect to the appropriateness of NSTAR's C&I evaluations, in the past the Department has approved methods not only consisting of billing analyses and simple end-use metering, but complex engineering re-analyses of projects, often using end-use metering of power and operating hours and/or records of industrial inputs, outputs, and weather data, on which energy use and savings depend. See, e.g., D.P.U. 92-217-B at 10-16, 23-25, 35-38, 42, 47, 50-51, 54. Therefore, the Department finds NSTAR's C&I evaluations to be appropriate.

The Department has reviewed NSTAR's savings estimates for the 1999-2000 Large C/I Retrofit, and 1999-2000 Lost Opportunities programs in detail. The Department notes that they were prepared in accord with approved methods and based firmly on metering. Based on its review, the Department finds no signs of bias and that the indicated precision levels make the estimates sufficiently precise. Because those savings estimates are sufficiently unbiased and sufficiently precise, the Department finds them to be reliable. Since those savings estimates are reviewable, appropriate, and reliable, the Department hereby accepts them.

The Department has also examined NSTAR's summary of savings from the BEEC and GAP load control programs (Exh. DTE-3-10(F)). The Department has previously approved the estimation method for these programs as appropriate and yielding results that are sufficiently unbiased and precise. Boston Edison Company, D.P.U. 97-1-CC at 16 (1998). Based on its review in this case, the Department similarly finds the current set of savings estimates to be reviewable, appropriate, and sufficiently unbiased and precise, making them reliable. Accordingly, the Department accepts NSTAR's savings estimates for the BEEC and GAP programs.

C. 1999-2000 Small C/I Program

The Department has examined NSTAR's sets of savings estimates for the 1999-2000 Small C/I program. For the non-lighting measures, such as refrigeration, the Department has detected no bias in NSTAR's savings estimates, based on 15 post-installation site surveys. The sampling framework used also makes those savings estimates sufficiently precise.

IV. COST-EFFECTIVENESS

A. Introduction

The Department is charged with determining the cost-effectiveness of an electric company's energy efficiency programs. G.L. c. 25A, § 11G; Guidelines §§ 3, 4. During examination of an electric company's energy efficiency plan, the Department reviews the pre-implementation cost-effectiveness of an electric company's energy efficiency programs.

Guidelines §§ 3, 4. However, the Department must also review energy efficiency programs following implementation to determine their actual cost-effectiveness. G.L. c. 25A, § 11G; Guidelines §§ 3, 4. In this proceeding, the Department reviews the post-implementation benefits and costs of NSTAR's energy efficiency programs to determine their actual cost-effectiveness.

According to the Guidelines, an energy efficiency program is considered to be cost-effective if its benefits are equal to or greater than its costs, in present value terms. Guidelines § 3.5. Benefits consist mainly of avoided electric energy and generating capacity costs, avoided transmission and distribution costs. Guidelines §§ 3.3.2, 3.3.3.

In this proceeding, the Department has reviewed the savings estimates attributable to NSTAR's energy efficiency programs and found them to be acceptable. Savings are a key component of the Department's cost-effectiveness test because the benefits used in the benefit-cost method are derived from savings.

With respect to costs, this aspect of energy efficiency programs consists of payments to vendors for equipment and services; payments to installers; rebates to participants; verification costs; costs to plan, administer, market, and evaluate programs; and shareholder incentives. Guidelines § 3.2.2. In this proceeding, NSTAR reported the final costs attributable to its 1998, 1999, and 2000 energy efficiency programs.

B. Residential Programs

NSTAR stated that it spent $37.48 million on its residential programs during 1998-2000 (Exh. NSTAR-1, Table S).[13] NSTAR reported that the lifetime savings produced benefits valued at $65.65 million (id.). Consequently, NSTAR reported overall residential B/C ratios of 2.93 in 1998, 1.13 in 1999, and 1.64 in 2000 (id., Tables S, 3, 4).

In particular, NSTAR reported that its residential programs achieved post-implementation B/C ratios of 1.00 or higher except for Energy Star Homes, Energy Star Appliances, and Low-Income Single Family programs during 1998-1999; and the Education and Heat Pump programs discontinued in 1998 (Exh. NSTAR-1, Table S). The Energy Star Appliances program was not cost-effective again during 2000 (id.).[14]

C. C&I Programs

In this proceeding, NSTAR stated that it spent $86.18 million on its C&I programs during the three program years (Exh. NSTAR-1, Table S). NSTAR projected that the lifetime savings are valued at $212.287 million (id.). NSTAR reported that on a post-implementation basis its overall C&I B/C ratios were 3.13 in 1998, 1.84 in 1999, and 2.19 in 2000 (id.

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13 NSTAR spent an additional $13.84 million in 2001 for to buy out contracts for savings accruing from measures installed during 1998 and 1999 pursuant to its IRM programs (Exh. NSTAR-1, Table S).

14 NSTAR did not report the Residential Conservation Services program. Moreover, NSTAR reported that its Education program was cost-effective in 1998, but reported no savings for it for 1999 or 2000 (Exh. NSTAR-1, Table S).

at Tables S, 3, 4). NSTAR reported that B/C ratios exceeded 1.00 for each C&I program in each program year, except for C&I New Construction in 1998, Large C&I Retrofit in 1998 (id., Table S).

D. Analysis and Findings

With respect to residential energy efficiency programs, the Department notes that for NSTAR the Energy Star Homes and Single-Family Low-Income programs did not become cost-effective until 2000, while the Energy Star Appliances program was still not cost-effective by the end of 2000.

The Department notes that NSTAR's Energy Star programs are market transformation programs, where savings may not be able to be determined promptly after a year of program implementation. Guidelines § 4.2.1(b). However, the Department notes that the Guidelines make no distinction between cost-effectiveness of ordinary programs and market transformation programs. The Department notes its concern regarding the use of customer funds to support a program that appears increasingly unlikely to be able to achieve the requisite cost-effectiveness given due time. The Department expects that customer-supported energy efficiency programs will most likely achieve cost-effectiveness in both pre- and post-implementation phases, and only in the rare occasion will a program fail to meet these tests. Otherwise, expenditures of customer funds will have too often failed to have actually provided the level of benefits necessary to justify that expenditure. The Department notes that, with respect to market transformation programs, Program Administrators may provide scenario analyses or sensitivity analyses regarding projections of program savings and cost-effectiveness. Guidelines § 4.2.1. The Department encourages the use of such techniques to better specify the range of savings and cost-effectiveness levels with the understanding that such techniques may provide a refinement of, but not a substitute for, cost-effectiveness.

With respect to C&I programs, NSTAR's programs were cost-effective, except for the Large C/I and C/I New Construction programs, and then during 1998 only, when they were re-starting. Based on its examination of the record, the Department finds NSTAR's energy efficiency programs to be cost-effective except for programs noted above.

The Department recognizes that market transformation programs may: (1) run for several years, (2) operate on a New England-wide basis, and (3) represent a diverse set of technologies. The Department and DOER are required to give "due emphasis" to statewide and regional market transformation programs in order to "eliminate market barriers to energy efficiency goods and services." As such, DOER includes market transformation programs in its statewide energy efficiency goals. G.L. c. 25A § 11G; 225 C.M.R. § 2.3.1.

On December 3, 2004, the Department conducted a technical conference with DOER, energy efficiency stakeholders, electric distribution companies, and the Cape Light Compact to discuss the above issues. The participants agreed to review present methods of measuring cost-effectiveness of market-transformation programs and, if appropriate, propose recommendations to the Department, pursuant to the Guidelines at §1(2).

V. SHAREHOLDER INCENTIVES

NSTAR's shareholder incentive calculation consists of two parts: (1) a payment based on the levels of expected (but not measured) savings from equipment installed in each of several programs in each program year (a total of 35 program-specific targets among the companies and years); and (2) payments determined by the levels of accomplishment in terms of market transformation goals (Exh. DTE-5-1, Attachments A, B, and C).[15] The first type of payment accounted for 77 percent of the total incentive payments claimed for 1998, 76 percent for 1999, and 64 percent for 2000 (id.). The second type accounted for the remainder (id.).

With respect to the levels of expected savings, NSTAR compared the energy savings expected from equipment and other measures that it pre-approved for installation with pre-specified MWH targets (id.). This comparison resulted in a total of $9.010 million in pre-tax incentive payments for the three program years (id.; Exh. NSTAR-2, Table 4). With respect to market transformation and low-income programs, among the three companies and three years, NSTAR compared its actual accomplishments to pre-specified targets such as product market share and new products introduced (Exh. DTE-5-1, Attachments A, B, and C). By fully meeting or exceeding 192 of 220 market transformation and low-income goals, NSTAR calculated that it earned a pre-tax incentive of $3.682 million (id.; Exh. NSTAR-2, Table 4). Thus, NSTAR's combined pre-tax[16] incentive for the three years amounts to $12.692 million (id.). That figure represents 10.3 percent of the $123.662 million spent by NSTAR to implement energy efficiency during the three program years (Exh. NSTAR-1 , Table 4).

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15 The performance targets for NSTAR's 1998-2000 shareholder incentives were established in previous Department Orders (D.T.E. 97-86; D.T.E. 97-86A; D.T.E. 98-16; D.T.E. 00-63). The 1998 shareholder incentives for Cambridge and Commonwealth were approved in a previous order. D.T.E. 98-16-A (2001).

16 The after-tax amount is substantially smaller.

Based on its review, the Department finds that NSTAR has correctly reported its accomplishments in terms of installing energy efficient equipment that was expected to achieve several billion lifetime KWH in savings and in terms of meeting most of a wide variety of program-specific market transformation and low-income program goals. According to the terms of the Plans approved by the Department, NSTAR has earned the shareholder incentives that it has claimed. Accordingly, the Department approves the proposed expenditures to pay the shareholder incentives as claimed.

VI. ORDER

Accordingly, after due notice and consideration, it is

ORDERED: That the demand-side management savings estimates for Boston Edison Company, Cambridge Electric Light Company, and Commonwealth Electric Company for the years 1998, 1999 and 2000, are hereby approved; and it is

FURTHER ORDERED: That Boston Edison Company, Cambridge Electric Light Company, and Commonwealth Electric Company shall recover, as specified above, certain shareholder incentives associated with its demand-side management performance for the calendar years 1998, 1999 and 2000, in the amount of $12,692,000; and it is

<u>FURTHER ORDERED</u>: That Boston Edison Company, Cambridge Electric Light Company, and Commonwealth Electric Company follow all directives in this order.

By Order of the Department,

/s/____________________________________
Paul G. Afonso, Chairman

/s/____________________________________
James Connelly, Commissioner

/s/____________________________________
W. Robert Keating, Commissioner

/s/____________________________________
Judith F. Judson, Commissioner

Appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the Order of the Commission be modified or set aside in whole or in part. Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission may allow upon request filed prior to the expiration of twenty days after the date of service of said decision, order or ruling. Within ten days after such petition has been filed, the appealing party shall enter the appeal in the Supreme Judicial Court sitting in Suffolk County by filing a copy thereof with the Clerk of said Court. (Sec. 5, Chapter 25, G.L. Ter. Ed., as most recently amended by Chapter 485 of the Acts of 1971).